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Gene expression profile in human leukocytes.

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Leukocytes are classified as myelocytic or lymphocytic, and each class of leukocytes consists of several types of cells that have different phenotypes and different roles. To define the gene expression in these cells, we have performed serial analysis of gene expression (SAGE) using human leukocytes and have provided the gene database for these cells not only at the resting stage but also at the activated stage. A total of 709,990 tags from 17 libraries were analyzed for the manifestation of gene expression profiles in various types of human leukocytes. Types of leukocytes analyzed were as follows: peripheral blood monocytes, colony-stimulating factor-induced macrophages, monocyte-derived immature dendritic cells, mature/activated dendritic cells, granulocytes, natural killer (NK) cells, resting B cells, activated B cells, naive T cells, CCR4(-) memory T cells (resting T(H)1 cells), CCR4(+) memory T cells (resting T(H)2 cells), activated T(H)1 cells, and activated T(H)2 cells. Among 38,961 distinct tags that appeared more than once in the combined total libraries, 27,323 tags were found to represent unique genes in certain type(s) of leukocytes. Using probability (P) and hierarchical clustering analysis, we identified the genes selectively expressed in each type of leukocytes. Identification of the genes specifically expressed in different types of leukocytes provides not only a novel molecular signature to define different subsets of resting and activated cells but also contributes to further understanding of the biologic function of leukocytes in the host defense system.

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